VTrans PDD Materials and Research Section

Annual Report January 2014

The mission of the Materials and Research Section is to produce accurate, timely information to support VTrans design and construction personnel in achieving high quality infrastructure solutions. Materials quality test results provide for safe efficient design in each project setting. Construction materials quality test results define not only contract compliance but also describe the reliability, durability and performance characteristics of our infrastructure during and after the construction process. Research and investigative services provide opportunity for innovation, accuracy and quality improvements. Expert interpretation of materials tests assures sound decision making.

HIGHLIGHTS OF THE YEAR

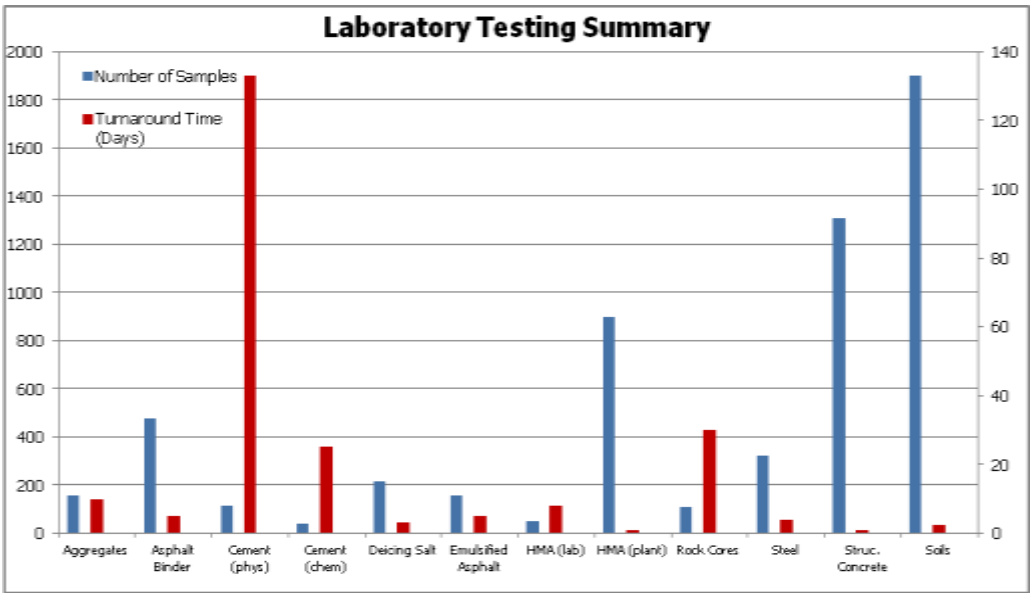
- Completed facilities punch list process for new laboratory, storage buildings and site support services for 32,000 sq. ft. Laboratory/Office and 4000 + sq. ft. Storage building including security, emergency power, closely controlled lab environments
- Supported record numbers of project level investigations (74) for foundation evaluations and recommendations with 3 projects requiring urgent response schedules
- Defined geotechnical scope and participated in major Rockfall Mitigation or Slope Stability projects at 8 major soil slope stability and 2 rock fall sites

Slope stability project located along US Route 4 in Hartford, VT.

- Inspected plant manufactured concrete, hot mix asphalt and precast concrete facilities in 6 states for VT use addressing over 350,000 tons HMA and 7500 cubic yards of concrete.
- Fulfilled accreditation requirements for all laboratory tests with both AMRL and CCRL onsite inspections in addition to processing all required proficiency samples to provide full compliance with over 120 standard methods.
- Processed over 27,000 individual tests on over 4000 samples through the central laboratory
- Published 12 research reports and research updates in addition to data acquisition at more than 50 separate site locations.
- Collected performance data from over 140 sites for research and investigative purposes.

Key Performance Indicators

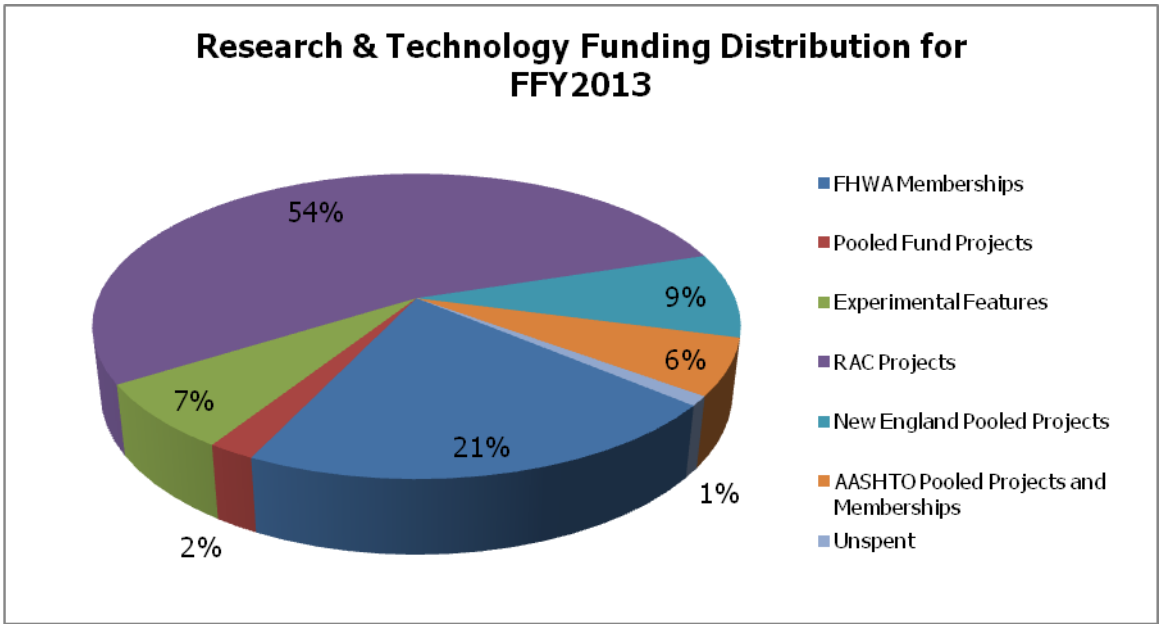
Key Performance Indicators include turnaround times for laboratory testing, numbers test/samples processed, numbers of material certifications processed, independent assurance activities completed in support of federal participation for project funding.



\Section Management

Management foci for the year addressed efficiency, transparency, skill building and strategic investment for emerging test methods:

- Invested in additional asphalt binder test equipment to increase the number of tests and address a new more rigorous standard for cracking and rutting of pavements.
- Fully integrated field and plant inspection services between HMA and Concrete, combined data systems for producer QC results and VTrans to give a complete picture of quality and fully deployed urgent notice of failed tests.
- Employee development resulted in 5 newly qualified test technicians for materials and retention of credentials for 14 staff while achieving 93% on-time feedback to employees.
- Initiated a plan for non-destructive evaluation deployment including ground penetrating radar and ultrasonic testing, which will preempt known concerns around certification-only acceptance
- with a common dispatcher providing uniform practices in both materials.
- Strengthened sample controls ranging from chain-of custody handling to recording sample location and status in an agency-wide database. This is Phase One of an effort to reduce inaccuracy and rework associated with samples.
- Successfully revised the research project selection system to include focus groups, increased participation from academia and provide stronger executive direction to the Research Advisory Council projects.



Unmet Needs

- Plant inspection of hot mix asphalt and structural concrete incorporated into Quality Assurance Program Level 3 projects were rarely sampled by state representatives for verification of producer test results.
- Field produced materials including reclaimed bases, cold mix pavements and field cast concrete emerged as areas for improvement in specification, process control and ease of inspection.
- Emerging polymeric materials such as Fiber Reinforced Plastics, field cured polymeric resin pipes cannot be tested at VTrans facilities either for qualification or acceptance. More frequently these types of low weight high strength materials will be incorporated into rehabilitations
- Aging equipment in the geotechnical investigation fleet resulted in delays and rescheduling affecting approximately 1/6 of a work year. Project schedules and consultant deployment were modified in addition to staffing/ location decisions for VTrans staff. Reliable equipment will promote effectiveness and efficiency.

Goals For Next Year

Three key objectives for 2014 are: improve specifications for field produced materials, define an effective way to ensure quality in all asphalt mix and structural concrete provided to VTrans and deploy high value non-destructive evaluation techniques that yield improved project decision making.